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P.O. BOX 3001
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| EXAMINER |
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MACCHIAROLO, PETER J

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| ART UNIT | PAPER NUMBER |
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2879

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 12/21/2006 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/024,783

Applicant(s)

VAN TONGEREN ET AL.

Examiner

Peter J. Macchiarolo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-8,10,11,13,14,17 and 21-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-8,10,11,13,14,17 and 21-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

The reply filed on 10/03/2006 consists of remarks related to the prior rejection of claims in the Previous Office Action. The above have been entered and considered. Applicant's request for reconsideration of the rejection in the last Office action is persuasive and, therefore, the rejection is withdrawn. However, in light of newly found prior art, pending claims 1, 4-8, 10, 11, 13, 14, 17, and 21-28 are not allowable as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 5, 7, 8, 10, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al (USPN 6013982: "Thompson").

Regarding claim 1, Thompson discloses at least in figure 2, an EL device comprising a substrate (22) an organic EL layer (24) on the substrate, a pattern-wise ink-jet printed electrode (25) atop the EL layer (24) on the substrate (22), the electrode (25) comprising a metal or metal alloy (pure indium, see col. 5, ll. 59-67) having a melting point of 250°C or less (inherent melting point of indium is about 150°C) that includes a profile that is characteristic of having been ink-jet printed in a molten form.

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Thompson is silent to the exact thickness of the electrode, but does teach in col. 4 ll. 61-67 that optimization of an electrode's thickness is required depending on certain platform requirements.

It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Further, one would be motivated to manufacture Thompson's electrode at least 5000 nm thick for a variety of reasons, including proper resistivity and efficient use of the electrode material.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the EL device of Thompson with the electrodes being at least 5000nm thick.

Regarding claim 4, Thompson shows at least in figure 2 the electrode (25) is an electrode for supplying electrons to the EL layer (24).

Regarding claims 5 and 14, Thompson discloses the metal used is indium, which has a work function of about 4.1 eV.

Regarding claim 7, Thompson discloses at least in figure 2, the device is a passive matrix type (col. 1, ll. 44) including one or more EL layers (24) sandwiched between row electrodes (25) and column electrodes (23), and independently addressable EL elements being formed at

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crossings of row (25) and column (23) electrodes; and the row electrodes (25) comprise a metal or metal alloy (see col. 5, ll. 59-67).

Regarding claim 8, the Examiner notes that the limitation, "a battery operated or hand-held electronic device provided with the EL device of claim" is an intended use type limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). In this case, the preamble has been considered, however is not patentable over Thompson since using a battery operated or hand held electronic device with the EL device of claim 1 is an obvious configuration.

Regarding claim 10, Thompson discloses a method for forming an EL device including a metal or metal alloy electrode (25, see col. 5, ll. 59-67) provided in accordance with a desired pattern, comprising forming one or more layers of organic EL (24) material on a surface and subsequently ink-jet printing molten metal or molten metal alloy (col. 5, ll. 61-67) in accordance with the desired pattern such that upon cooling of the molten metal or metal alloy, the metal or metal alloy electrode is formed atop the one or more layers of organic EL material.

Thompson is silent to the electrode being at least 5000nm thick.

However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

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In re Aller, 105 USPQ 233. Further, one would be motivated to manufacture Thompson's electrode at least 5000 nm thick for a variety of reasons, including proper resistivity and efficient use of the electrode material.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the EL device of Thompson with the electrodes being at least 5000nm thick.

Regarding claims 13 and 22, Thompson discloses the metal is indium (see col. 5, ll. 59-67), which inherently has a melting point between 60°C and 150°C.

Claims 6, 11, 17, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of previously cited Yudasaka et al (USPN 6541918; "Yudasaka").

Regarding claims 6 and 11, Thompson teaches the limitations addressed in rejected claims 1 and 10, and will not be repeated here.

However, Thompson is silent to a relief pattern.

Yudasaka teaches that relief patterns (step cutting insulating films) improve the accuracy and precision of a material on a surface when using an ink-jet manufacturing method, which in turn improves the overall quality of an EL device.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture the device of Thompson with the relief patterns of Yudasaka to improve the overall quality of the device.

Regarding claim 17, Thompson discloses at least in figure 2, the device is a passive matrix type (col. 1, ll. 44) including one or more EL layers (24) sandwiched between row electrodes (25) and column electrodes (23), and independently addressable EL elements being formed at crossings of row (25) and column (23) electrodes; and the row electrodes (25) comprise a metal or metal alloy (see col. 5, ll. 59-67).

Regarding claim 21, Thompson is silent to relief patterns.

However, Yudasaka teaches that the relief patterns are formed by photolithography, indicating that they are made from a photoresist material. The motivation and reasons for combining are the same as for claim 11.

Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Yudasaka in further view of Applicant's Admitted Prior Art.

Regarding claim 23, Thompson is silent to ink-jet printing a selection layer on the surface.

However, as Applicant admits in the paragraph spanning pages 13 and 14, such selection layers and inks used for manufacturing these layers are known.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to ink-jet a selection layer onto the device of Thompson since Yudasaka's selection layer will increase the accuracy of the electrode's position and ink-jetting is a method that allows for very quick and accurate application over a large area.

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Regarding claim 24, Thompson is silent to a selection layer and Yudasaka is silent to the exact pattern.

However, printing the selection layer on the surface using an other pattern that is complementary to the desired pattern is an obvious modification in light of Thompson's electrode pattern, since one skilled in the art will recognize the selection layer will not interfere with the electrode's physical position and overall resistance thereby simplifying electrical power calculations and manufacturing techniques.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture the selection layer on the surface using an other pattern that is complementary to the desired pattern to simplify electrical power calculations and manufacturing techniques.

Regarding claim 25, Yudasaka is silent to the selection layer comprising a photoresist.

However, as Applicant admits in the first full paragraph of page 14, using a selection layer that comprises a photoresist layer is known in the art. The motivation and reasons for combining are the same as for claim 23 above.

Furthermore, since the Examiner agrees with Applicant's argument filed 04/21/2005 that claims 23-25 are not distinct and independent, the Examiner asserts such methods would have been obvious to one skilled in the art.

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Regarding claim 26, Thompson discloses a method of manufacturing an EL device including a metal or metal alloy electrode provided in accordance with a desired pattern, comprising ink-jet printing a metal or metal alloy upon a surface to form the electrode.

Thompson is silent to ink-jet printing a selection layer on the surface to facilitate selective deposition of the metal or metal alloy upon the surface or the exact thickness of the electrode.

However, as discussed above, ink jet printing a selection layer will improve the overall quality of the device while enabling for a quick and easy manufacturing process.

Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

In re Aller, 105 USPQ 233. Further, one would be motivated to manufacture Thompson's electrode at least 5000 nm thick for a variety of reasons, including proper resistivity and efficient use of the electrode material.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the EL device of Thompson by ink-jet printing the selection layer of Yudasaka with the electrodes being at least 5000nm thick to improve the overall quality of the device while enabling for a quick and easy manufacturing process with an electrode that including proper resistivity and makes efficient use of the electrode material.

Regarding claim 27, Thompson is silent to a selection layer and Yudasaka is silent to the exact pattern.

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However, printing the selection layer on the surface using an other pattern that is complementary to the desired pattern is an obvious modification in light of Thompson's electrode pattern, since one skilled in the art will recognize the selection layer will not interfere with the electrode's physical position and overall resistance thereby simplifying electrical power calculations and manufacturing techniques.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture the selection layer on the surface using an other pattern that is complementary to the desired pattern to simplify electrical power calculations and manufacturing techniques.

Regarding claim 28, Yudasaka is silent to the selection layer comprising a photoresist.

However, as Applicant admits in the first full paragraph of page 14, using a selection layer that comprises a photoresist layer is known in the art. The motivation and reasons for combining are the same as for claim 27 above.

Response to Arguments

Applicant's arguments filed 10/03/2006 have been fully considered but are moot in view of the new ground(s) of rejection.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375.

The examiner can normally be reached on 8:30 - 5:00, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Respectfully submitted,

By



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